

Cofc



PATENT

Docket No. 00SC137US8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s) : Jeffrey F. DeNatale et al.

U.S. Patent No. : 7,157,993

Issued : January 2, 2007

Serial No. : 10/676,875

Examiner: Bernard Rojas

Filed : September 30, 2003

Group Art Unit: 2832

Customer No. : 23935

Title: 1:N MEM SWITCH MODULE

Certificate of Corrections Branch

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Certificate

MAR 08 2007

TRANSMITTAL REQUEST FOR CERTIFICATE OF CORRECTION
OF OFFICE MISTAKE

Sir/Madam:

Transmitted herewith is PTO/SB/44 Certificate of Correction, Request for Certificate of Correction – Office Mistake, and an itemized postcard.

Respectfully submitted,

Dated: 3-1-07

Steven C. Patrick

Registration No. 40,341

Attorney for Applicant(s)

KOPPEL, PATRICK, HEYBL & DAWSON

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(805) 373-0060

U: kpl00SC137US8/transmittal

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service via first class mail in an envelope addressed to: Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

3-1-07

Date

Karen Patrick

MAR - 8 2007

PATENT

Docket No. 00SC137US8



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s) : Jeffrey F. DeNatale et al.
U.S. Patent No. : 7,157,993
Issued : January 2, 2007
Serial No. : 10/676,875 Examiner: Bernard Rojas
Filed : September 30, 2003 Group Art Unit: 2832
Customer No. : 23935

Title: 1:N MEM SWITCH MODULE

Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REQUEST FOR CERTIFICATE OF CORRECTION
OF OFFICE MISTAKE**

Sir/Madam:

We have identified the following Office mistakes in the above issued patent:

In Claim 26, line 67, change "MEN switches." to --MEM switches.--

In Claim 27, line 1, change "RE" to --RF--.

In Claim 29, line 7, replace the words "at a given such that" with --at a given design frequency such that--.

Cancel Claim 4 in the issued patent. This claim was cancelled pursuant to Amendment After Allowance per 37 CFR 1.312 dated July 14, 2006 (identified in the Amendment as Claim 5). A copy of the Amendment After Allowance is attached as Exhibit "A".

Cancel Claim 20 in the issued patent. This claim was cancelled pursuant to Amendment after Allowance per 37 CFR 1.312 dated July 14, 2006 (identified in the Amendment as Claim 21). See Exhibit A.

Cancel Claim 25 in the issued patent. This claim was cancelled pursuant to a telephone conversation with Examiner Rojas on November 8, 2006. As instructed by Examiner Rojas, a Proposed Examiner's Amendment was faxed directly to him canceling this claim (originally numbered as Claim 29 in the application as filed and in this Amendment). The Proposed Examiner's Amendment is attached as Exhibit "B".

In Claim 27, delete the paragraph beginning on line 18 through line 21 pursuant to Proposed Examiner's Amendment (originally numbered as Claim 31 in the application as filed and in Exhibits A and B). The text to be deleted is as follows:

MAR - 8 2007

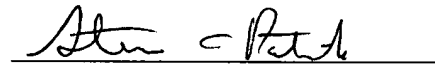
“said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point.”

In Claim 29, delete the paragraph beginning on line 4 through line 7 pursuant to Proposed Examiner's Amendment (originally numbered as Claim 33 in the application as filed and in Exhibits A and B). The text to be deleted is as follows:

“said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point.”

Respectfully submitted,

Dated: 3-1-07



Steven C. Patrick
Registration No. 40,341
Attorney for Applicant(s)

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MAR - 8 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/676,875 Confirmation No. 8094
Applicants : DeNatale et al.
Filed : September 30, 2003
TC/A.U. : 2832
Examiner : B. Rojas
Docket No. : 00SC137US8
Title: 1:N MEM SWITCH MODULE

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE

per 37 CFR 1.312

Sir:

This amendment is filed per 37 CFR 1.312, after receipt of a Notice of Allowance mailed on 5/18/2006. The amendment is filed for the purpose of correcting inventorship in the instant application, in accordance with 37 CFR 1.48(b). Entry of this amendment is respectfully requested.

Amendments to the Specification - there are no amendments to the specification.

Amendments to the Claims are reflected in the listing of the claims that begins on page 2 of this paper.

Amendments to the Drawings - there are no amendments to the drawings.

Remarks/Arguments begin on page 11 of this paper.

MAR - 8 2007.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claim 1 - canceled

2. (previously presented) A 1:N micro-electromechanical (MEM) switch module, comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, and

N MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line via respective switch input lines and each of said output contacts connected to respective signal output lines,

wherein each of said switch input lines has an associated effective capacitance, said switch input lines designed such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency.

3. (previously presented) The switch module of claim 2, wherein at least one of said signal output lines includes one or more open stub sections which effect the matching of said signal output line's inductance to its effective capacitance.

4. (previously presented) The switch module of claim 2, wherein said signal input line has a terminus point and each of said switch input lines is connected to said signal input line at said terminus point, all N of said MEM switches arranged such that they are rotationally symmetric about said terminus point.

Claim 5 - canceled

6. (previously presented) The switch module of claim 2, wherein each of said MEM switches is an ohmic-contact switch which provides a conductive path upon closure.

7. (previously presented) The switch module of claim 2, wherein each of said MEM switches is a capacitive switch which couples an applied signal between said input and output contacts through a thin insulator layer upon closure.

8. (previously presented) The switch module of claim 2, wherein each of said MEM switches is electrostatically-actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate.

9. (original) The switch module of claim 8, wherein said drive voltages are applied to at least some of said movable contacts using air bridges which traverse signal lines or traces on said substrate.

10. (previously presented) The switch module of claim 2, wherein each of said MEM switches is thermally-actuated.

11. (previously presented) The switch module of claim 2,

wherein each of said MEM switches is piezoelectrically-actuated.

12. (previously presented) The switch module of claim 2, wherein each of said MEM switches is actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches.

13. (previously presented) The switch module of claim 2, wherein the thickness of said substrate is 5-10 mils.

14. (previously presented) The switch module of claim 2, wherein said substrate comprises gallium arsenide (GaAs).

15. (previously presented) The switch module of claim 2, wherein said substrate comprises indium phosphide (InP).

16. (previously presented) The switch module of claim 2, wherein said substrate comprises silicon.

17. (previously presented) The switch module of claim 2, wherein said substrate comprises microwave-compatible ceramics.

18. (withdrawn) The switch module of claim 1, wherein first and second ones of said MEM switch modules form a phase shifter which includes N transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules

operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal passes through two of said MEM switches.

19. (withdrawn) The switch module of claim 18, wherein $N = 4$, said phase shifter is a 2-bit phase shifter, and said four transmission lines are arranged to provide relative phase shifts of approximately 0° , 90° , 180° and 270° , respectively, to said input signal.

20. (withdrawn) The switch module of claim 18, wherein at least two of said phase shifters are cascaded to provide a greater number of distinct phase states.

Claim 21 - canceled

22. (withdrawn) The switch module of claim 21, wherein first and second ones of said MEM switch modules form a 2-bit phase shifter which includes four transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal passes through two of said MEM switches.

23. (withdrawn) The switch module of claim 22, wherein said

four transmission lines provide relative phase shifts of approximately 0° , 90° , 180° and 270° , respectively, to said input signal.

24. (withdrawn) The switch module of claim 22, wherein at least two of said phase shifters are cascaded to provide a greater number of distinct phase states.

25. (withdrawn) An RF micro-electromechanical (MEM) phase shifter, comprising:

at least two 1:N micro-electromechanical (MEM) switch modules, each of which comprises:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, and

N MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line via respective switch input lines and each of said output contacts connected to respective signal output lines,

each of said switch input lines having an associated effective capacitance, said switch input lines arranged such that the inductance of each switch input line is matched to its effective capacitance,

N transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of a first switch module and at the other end to a respective one of the signal output lines of a second switch module, said switch modules

operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of another of said switch modules via one of said transmission lines such that said input signal is phase-shifted by predetermined amount and passes through two of said MEM switches.

26. (withdrawn) The phase shifter of claim 25, wherein said phase shifter is a 2-bit phase shifter comprising two switch modules having four MEM switches each, and said four transmission lines provide relative phase shifts of approximately 0° , 90° , 180° and 270° , respectively, to said input signal.

27. (withdrawn) The phase shifter of claim 25, wherein at least one of said signal output lines and/or transmission lines includes one or more open stub sections which effect the matching of said signal output line's inductance to its effective capacitance.

28. (withdrawn) The phase shifter of claim 25, wherein, for each of said switch modules, said signal input line has a respective terminus point and each of said input contacts is connected to said signal input line at said terminus point via respective ones of said switch input lines, all N of said MEM switches arranged symmetrically about said terminus point.

29. (withdrawn) The phase shifter of claim 28, wherein $N = 4$ and the MEM switches of each switch module are arranged along four sides of a pentagon centered about said module's terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point.

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30. (withdrawn) The phase shifter of claim 25, wherein each MEM switch of each switch module is actuated with a respective drive voltage applied between its movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said module's terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches.

31. (withdrawn) An RF micro-electromechanical (MEM) phase shifter comprising first and second 1:4 MEM switch modules, each of said switch modules comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point,

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each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said

corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines arranged such that the inductance of each switch input line is matched to its effective capacitance, and

four transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal is phase-shifted by predetermined amount and passes through two of said MEM switches.

32. (withdrawn) The phase shifter of claim 31, further comprising additional ones of said 1:4 switch modules interconnected with said first and second switch modules such that additional transmission lines having lengths different from said four transmission lines are provided between first and second ones of said signal input lines.

33. (withdrawn) A 1:4 micro-electromechanical (MEM) switch module, comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, said signal input line having a terminus point, and

MAR - 8 2007

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point,

said signal output lines routed away from said module on the side of said module opposite said fifth side, to facilitate the interconnection of said signal output lines,

each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines designed such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency.

34. (withdrawn) The switch module of claim 33, wherein said signal input line and signal output lines are co-planar waveguides which transition to respective microstrips near said module.

Serial No. 10/676,875
Amdt. dated July 14, 2006

REMARKS

This amendment is filed per 37 CFR 1.312, after receipt of a Notice of Allowance mailed on 5/18/2006. The amendment is filed for the purpose of correcting inventorship in the instant application, in accordance with 37 CFR 1.48(b). Entry of this amendment is respectfully requested.

Cancellation of claims

Claims 5 and 21 are canceled herein.

Correction of Inventorship

The prosecution of the present application has resulted in the amendment of some claims and the cancellation of other claims. As a result, the correct number of inventors for the claims as presently constituted is fewer than all of the currently named inventors.

As such, the applicants request that the following names be deleted as inventors for the instant application, as they are not actual inventors of the invention being claimed:

Gabriel M. Rebeiz

Guan-Leng Tan

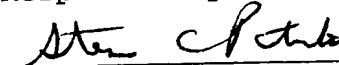
The inventive contributions of Gabriel M. Rebeiz and Guan-Leng Tan are no longer being claimed in the present application.

As set forth in 37 CFR 1.48(b)(2), we authorize the Commissioner to charge the processing fee of \$130 per 37 1.17(i) to Deposit Account No. 18-1750. The Commissioner is also hereby authorized to charge Deposit Account No. 18-1750 to cover any

Serial No. 10/676,875
Amdt. dated July 14, 2006

additional filing fees that occur during the pendency of this application.

Respectfully submitted,



Steven C. Patrick
Registration No. 40,341
Attorney for Applicant

July 14, 2006

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MAR - 8 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/676,875 Confirmation No. 8094
Applicants : DeNatale et al.
Filed : September 30, 2003
TC/A.U. : 2832
Examiner : B. Rojas
Docket No. : 00SC137US8
Title: 1:N MEM SWITCH MODULE

PROPOSED EXAMINER'S AMENDMENT

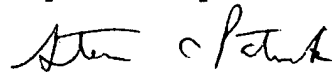
Examiner Rojas:

Per our phone conversation of 11/8/06, please find attached amendments to dependent claim 29, and independent claims 31 and 33. As noted, I would like to cancel claim 29, and to amend claims 31 and 33 as marked.

Please let me know if there is anything else I need to do in order to put this application into final form.

The Commissioner is also hereby authorized to charge Deposit Account No. 18-1750 to cover any additional filing fees that occur during the pendency of this application.

Respectfully submitted,



Steven C. Patrick
Registration No. 40,341
Attorney for Applicant

November 8, 2006

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Thousand Oaks, California 91360
(805) 373-0060

MAR - 8 2007

Amendments to the Claims:

29. (**cancel**) The phase shifter of claim 28, wherein $N = 4$ and the MEM switches of each switch module are arranged along four sides of a pentagon centered about said module's terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point.

31. (**currently amended**) An RF micro-electromechanical (MEM) phase shifter comprising first and second 1:4 MEM switch modules, each of said switch modules comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

~~said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point,~~

each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said

corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines arranged such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency, and

four transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal is phase-shifted by predetermined amount and passes through two of said MEM switches.

33. (**currently amended**) A 1:4 micro-electromechanical (MEM) switch module, comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input

and output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

~~said MEM switches arranged along four sides of a pentagon centered about said terminus point, said signal input line bisecting the fifth side of said pentagon en route to said terminus point,~~

said signal output lines routed away from said module on the side of said module opposite said fifth side, to facilitate the interconnection of said signal output lines,

each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines designed such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency.

TRANSMISSION VERIFICATION REPORT

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PAGE(S) 05
RESULT OK
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FAX COVER SHEET

DATE: November 8, 2006

FROM: Steven Patrick

TO: EXAMINER BERNARD ROJAS

RE: Patent application 10/676,875

OUR REF: 00SC137US8

FAX NO.: 571-273-1998

MESSAGE: Please see attached Proposed Examiner's Amendment.

NUMBER OF PAGES (Including cover sheet): 5

If you have any problems receiving this FAX, please call (805) 373-0060.

MAR - 8 2007

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 3

PATENT NO. : 7,157,993
APPLICATION NO.: 10/676,875
ISSUE DATE : January 2, 2007
INVENTOR(S) : Jeffrey F. DeNatale et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 26, line 67, change "MEN switches." to --MEM switches.--

Claim 27, line 1, change "RE" to --RF--

Claim 29, line 7, replace "at a given such that" with --at a given design frequency such that--

Claim 4 is cancelled.

Claim 20 is cancelled.

Claim 25 is cancelled.

Claim 27 is amended to read as follows:

An RF micro-electromechanical (MEM) phase shifter comprising first and second 1:4 MEM switch modules,

each of said switch modules comprising:

a substrate,

a signal input line on said substrate for receiving a signal to be switched, said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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Thousand Oaks, CA 91360

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MAR - 8 2007

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

Page 2 of 3

PATENT NO. : 7,157,993
APPLICATION NO.: 10/676,875
ISSUE DATE : January 2, 2007
INVENTOR(S) : Jeffrey F. DeNatale et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines arranged such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency, and

four transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal is phase-shifted by predetermined amount and passes through two of said MEM switches.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 3 of 3

PATENT NO. : 7,157,993
APPLICATION NO.: 10/676,875
ISSUE DATE : January 2, 2007
INVENTOR(S) : Jeffrey F. DeNatale et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 29 is amended to read as follows:

A 1:4 micro-electromechanical (MEM) switch module, comprising:
a substrate,
a signal input line on said substrate for receiving a signal to be switched,
said signal input line having a terminus point, and
four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,
said signal output lines routed away from said module on the side of said module opposite said fifth side, to facilitate the interconnection of said signal output lines,
each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,
each of said switch input lines having an associated effective capacitance, said switch input lines designed such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency.

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